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THE INFLUENCE OF THE ATTESTED HERD SCHEME ON THE LOCAL INCIDENCE AND DEGREE OF TUBERCULOSIS IN SLAUGHTERED COWS AND CALVES

BY

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Until 1937 the percentage of cows infected with tuberculosis was high in the county of Ayrshire. This was due to the predominant type of farming being dairying with the cattle housed from October to March. The district is now (1949) nearly free from the disease since the degree of attestation (*i.e.*, the percentage of herds free of tuberculosis as judged by the tuberculin test) is now approximately 90 per cent. As a very large proportion of the cattle from the area pass through Ayr Abattoir, where full records since 1924 on the cause of condemnations are available, it was felt that a study of these records might yield valuable information on the effect of the eradication of tuberculosis in the herds and the frequency of tuberculosis in individual carcases. The figures throughout the period are comparable since one of us (J. R.) has been personally responsible for all the condemnations during the whole period. No great variation in the standard of the inspection has therefore occurred. Figures of this type for America have been published by Smith (1944), White (1945), and Myers (1946), but are not strictly comparable as they are based on nation-wide returns and are not detailed. The present figures refer only to cows and to one district which is surrounded by areas of higher tuberculosis incidence.

While bullocks were drawn from a wider area, cows and calves were almost entirely supplied from the local district and attention has therefore been confined to the returns for these latter two types of animals. Between 1924 and 1948 the average number of cows passing through the abattoir per year was 1,604 with a maximum of 2,361 in 1939 and a minimum of 862 in 1948. The number of calves averaged 7,432, the maximum being 12,758 in 1945 and the minimum 4,241 in 1936. The records show the number of cow carcases wholly, and the number partially, condemned as well as the number of each separate set of organs condemned other than those from animals wholly condemned. They are not quite complete since there is no method of ascertaining in how many animals only one set of organs was condemned and in how many several sets were condemned. (One " set " consists of lungs and adjacent glands, another of bowels and mesenteric glands, etc.) To obtain an estimate of the " total " percentage of tuberculosis, therefore, it has been necessary to add the number of " totally condemned " carcases to the number of sets of lungs or bowels condemned, taking whichever of the latter was the greater. The figure so obtained is obviously slightly less than the true figure but it is not thought that this error is very great, while the method is one often used for the interpretation of such data, *e.g.*, in the reports published by the Corporation of Glasgow (1900-48).

The attested herd scheme started in 1935 and up to this date the number of animals in tuberculosis-free herds was not large since Douglas (1934) states that about 2,000 to 3,000 cows were in tuberculosis-free herds in 1933. After 1935 the records show that the percentage of attested (*i.e.*, tuberculosis-free) animals rose rapidly till 1939, remained relatively stable till 1943 and then again rose rapidly. The main figures are set out in Table I and have been divided and represented graphically in the succeeding figures. Figure 1 shows how total tuberculosis and carcase tuberculosis decreased as attestation proceeded. The total incidence of tuberculosis in cows recorded in the abattoir shows that during the first years, *i.e.*, until the percentage of attested animals reached 25 per cent., there was little change in the amount of tuberculosis in slaughtered animals. It then fell rapidly, especially in organ tuberculosis as distinct from carcase tuberculosis, till 1940 in which year the proportion of attested animals had reached 40 per cent. and the proportion of tuberculous cows in the slaughterhouse had fallen to 20 per cent. (*i.e.*, just under half the rate previous to attestation). These rates remained stable until 1944 when the attested herd scheme was again encouraged and the percentage of attested animals rose while the percentage of tuberculous animals fell. If analysed as in Table II where the number of tuberculous cows slaughtered is related to the number of non-attested cattle the ratio of infected animals to the total exposed to infection, *i.e.*, the non-attested stocks, is also found to decrease. This is partly due to the decrease in the total number of cows slaughtered but it is greater than would be expected on a proportionate basis and may indicate that there is a decrease in the tuberculosis incidence in non-attested cattle in an area when a large proportion of the animals are attested. It must be borne in mind, however, that a factor possibly influencing the figures is that the proportion of feeding herds to dairy herds, though small, is greater in the non-attested than in the attested groups. Thus the number of cows relative to the total cattle population (non-attested) is lower than when a higher proportion of animals are in dairy herds. This will cause the percentage figures in the last column of Table II to be slightly too low. On the other hand, all the tuberculous cows will not be from the local non-attested stock. Some will be from breakdowns in attested herds and a few may originate from outside the area. This will raise the percentage. However, there is certainly no indication that the incidence of tuberculosis is particularly high in the small proportion of herds left outwith the attested herd scheme and therefore the entire eradication of tuberculosis from the area should not be difficult, even though the herds themselves tend to be smaller. (There has been a steady progressive drop in the average number of cattle per herd within the attested scheme. Thus in 1935 the average number was 78.5 cows while in 1948 it was 59.) It would be interesting to know if this apparent decrease in tuberculosis in non-attested

TABLE I

TUBERCULOSIS IN THE CARCASES AND ORGANS OF COWS AT AYR ABATTOIR

Year	Number of Cows	Number of carcases condemned: Wholly	%	Partially	%	Total	%	Number of lungs condemned	Number of bowels condemned	Total tuberculosis	%	Percentage of total tuberculosis with carcase involvement
1924	1,059	31	2·7	110	10·3	132	12·3	202	190	233	21·8	56·5
1925	1,128	53	4·7	124	11·0	177	15·7	246	229	299	26·0	59·2
1926	1,283	54	4·2	133	10·4	187	14·6	281	287	341	26·6	54·8
1927	1,645	95	5·8	179	10·9	274	16·7	385	375	480	29·2	57·1
1928	1,217	77	6·3	162	13·3	239	19·6	350	347	427	35·1	56·0
1929	2,112	133	6·3	270	12·8	403	19·1	678	702	835	39·5	48·3
1930	1,814	118	6·5	198	10·9	316	17·4	672	620	790	43·5	40·0
1931	1,892	133	7·0	176	9·3	309	16·3	695	636	838	43·8	37·3
1932	1,645	191	11·6	153	9·3	344	20·9	620	564	811	49·4	42·5
1933	1,728	152	8·8	140	8·1	292	16·9	621	530	773	44·7	37·7
1934	1,871	163	8·7	133	7·1	296	15·8	558	474	721	38·5	41·0
1935	2,171	201	9·2	112	5·2	313	14·4	673	543	874	40·2	35·8
1936	2,054	184	9·0	124	6·0	308	15·0	746	678	930	45·3	33·1
1937	2,117	160	7·6	140	6·6	300	14·2	835	789	995	47·0	30·2
1938	1,662	94	5·7	89	5·4	183	11·1	669	613	763	46·0	24·0
1939	2,361	107	4·5	112	4·7	219	9·2	628	641	748	31·8	29·2
1940	1,281	56	4·4	36	2·8	92	7·2	198	188	254	19·8	36·2
1941	1,477	51	3·4	20	1·4	71	4·8	247	200	298	20·2	23·8
1942	1,446	54	3·7	21	1·4	75	5·2	293	172	347	24·0	21·6
1943	1,537	45	2·9	20	1·3	65	4·2	342	133	387	25·2	16·7
1944	1,954	46	2·4	16	0·8	62	3·2	321	133	367	18·7	16·9
1945	1,578	40	2·5	13	0·8	53	3·3	210	99	250	15·8	21·2
1946	1,227	15	1·2	8	0·6	23	1·8	81	33	96	7·8	24·0
1947	990	10	1·0	4	0·4	14	1·4	50	35	60	6·0	23·3
1948	862	4	0·5	3	0·3	7	0·8	32	22	36	4·2	19·5

Total tuberculosis refers to the number of wholly condemned carcases added to the number of lungs or bowels condemned, whichever was the greater.

TABLE II

THE PERCENTAGE OF TUBERCULOSIS IN NON-ATTESTED CATTLE IN AYRSHIRE

Year	Number cattle	Number attested	Number not attested	Tuberculosis on slaughter	% T.B. in non-attested
1935	128,368	2,357	126,011	874	0·69
1936	127,965	10,732	117,233	930	0·81
1937	127,590	22,672	104,918	995	0·95
1938	128,132	34,910	83,222	763	0·92
1939	132,254	49,900	82,354	748	0·91
1940	136,465	54,800	81,665	254	0·31*
1941	138,336	57,100	81,236	298	0·37
1942	140,045	57,950	82,095	347	0·42
1943	142,398	59,900	82,498	387	0·47
1944	137,441	69,800	67,641	367	0·54
1945	141,614	93,359	48,255	250	0·52
1946	142,911	106,736	36,175	96	0·26
1947	144,734	114,397	30,337	60	0·20
1948	147,769	123,748	24,021	36	0·15

* The number of cows slaughtered decreased considerably in 1940 and then rose steadily to 1944, since when they have decreased again.

herds is in agreement with the results of the tuberculin test. If it is, then the tuberculin test should show a decrease in the percentage of reactors in the herds in this area being tested for the first time.

As attestation has increased the total amount of tuberculosis in slaughtered cows naturally has decreased.

In Fig. 2 the figures for carcase tuberculosis are divided into carcases totally condemned and carcases partially condemned. These condemnations can be divided into three "phases". Previous to 1930 the percentage of carcases partially condemned was from two to four times as great as the percentage totally condemned. Between 1930 and 1939 there was considerable variation, but on the whole the percentage of carcases totally condemned was greater than the number partially condemned. After 1940 the percentage totally condemned has been consistently greater. This indicates either that the standard of condemnation has become more severe in recent years or that the animals have been more seriously affected. If this latter is the case it would be expected that the proportion of carcase involvement to total tuberculosis would be greater in the more recent years, but this is not so since there has been a greater proportional decrease in carcase tuberculosis (from between 15 per cent. and 20 per cent. down to 1 per cent.) than in total tuberculosis (from 40 per cent. down to 4 per cent.). The relationship between carcase involvement and total tuberculosis expressed as a percentage is given in the last column of Table I where it will be seen that whereas in the earlier years of the period the percentage of carcases infected was approximately 50 per cent. of the total number condemned for tuberculosis, more recently the proportion has been about 20 per cent. These figures show that the type of tuberculosis now seen at the abattoir is more often an early case and that therefore the probable explanation of the greater proportion of total carcase condemnations is that there is a stricter interpretation of the meat regulations despite the fact that the same worker has been responsible throughout. This is not a deliberate policy but is probably due to the comparative rarity of the condition. Another indication that the cases of tuberculosis seen are in the earlier stages of the disease is that the degree of intestinal involvement as compared to pulmonary infection is less than in earlier years. These figures are also given in Table I and are graphically expressed in Fig. 3 where intestinal infection is shown as a percentage of the number of pulmonary cases. Up to 1940 the alimentary tract was involved in as many cases as the pulmonary but since that date the number of condemnations for pulmonary tuberculosis has considerably

exceeded those of alimentary. If Stamp and Wilson (1946) are correct in holding that the primary complex in the bovine female is predominantly pulmonary, these figures would be evidence that the cases of tuberculosis now seen are in the early stages of the disease. It is, however, also possible that the lesser degree of intestinal involvement is due to the decrease in the amount of mammary tuberculosis and hence of infected milk. The incidence of tuberculosis in slaughtered bull calves, *i.e.*, animals up to ten months old, is of no value in assessing the degree of tuberculosis in the milk. The average number killed per annum was 7,432 and very few were tuberculous (approximately 0.25 per cent.) especially when compared with other areas (*e.g.*, Gofton (1937) reports an incidence of 2 per cent. in calves in Edinburgh). If expressed graphically as in Fig. 4, it is seen that except for the year 1938 the curve obtained is similar to that for total tuberculosis. The high figure for 1938 can be accounted for by one heavily infected herd being slaughtered *in toto*. There are however some discrepancies. In 1929, 1941, 1942 and 1943 the percentage of young animals infected decreased while the percentage of total tuberculosis rose. The graph also shows the price of milk and in these years this price was rising. In fact, as the graphs show, there is a close inverse fit between the price of milk and the degree of infection in young animals. While this is of course no proof that the two are cause and effect (such proof is not obtainable) it is possible that tuberculosis in young animals may be related not only to the extent of tuberculosis infection in the area but also to the price of milk (Anonymous, 1933 ; Gibson, 1949) since when milk is very cheap it is used for calf rearing more than when it is dear. While this is good practice in attested herds, in non-attested herds it leads to the spread of tuberculosis in the calves. It would appear therefore that economic prices for milk from non-attested farms may be some aid to the eradication of tuberculosis.

Summary

Since the introduction of the attested herd scheme in 1935 the percentage incidence of tuberculosis in cows slaughtered in Ayr has decreased from over 40 to 4. The

FIGURE 1

The Influence of Attestation on Tuberculosis at the Abattoir

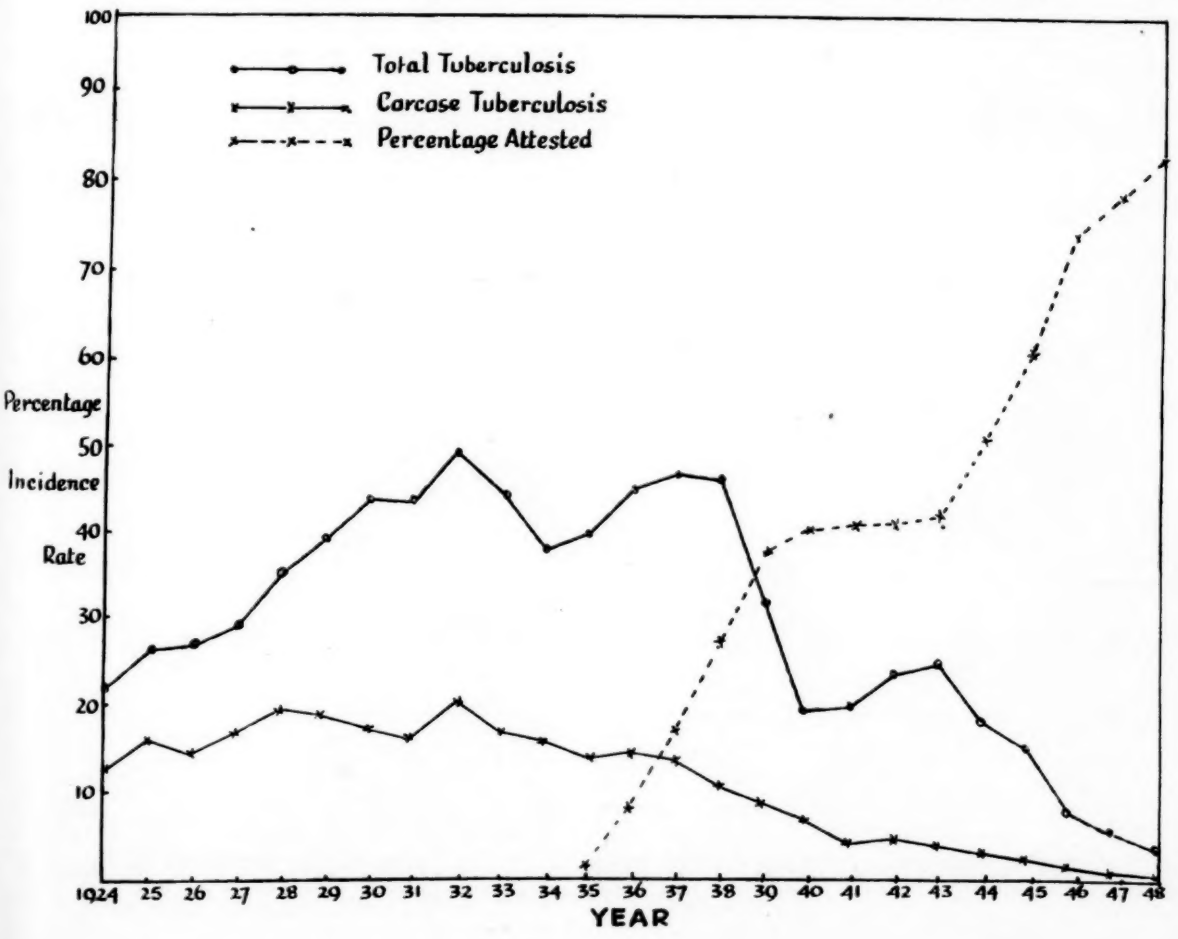


FIGURE 2

Carcases Condemned for Tuberculosis

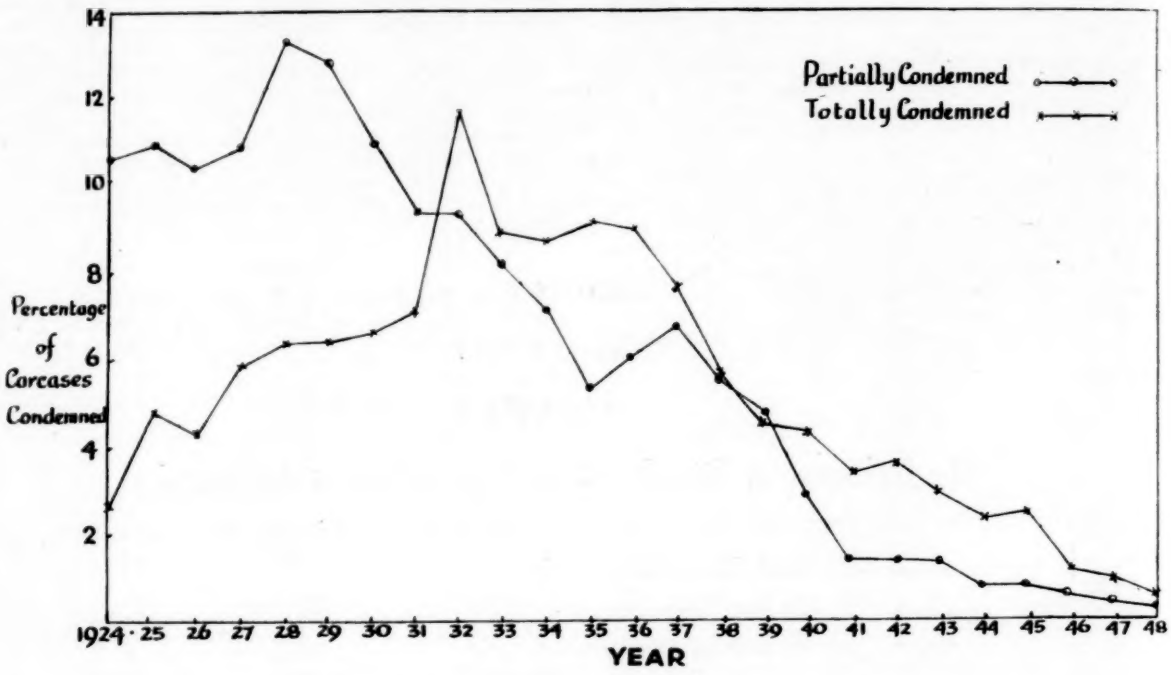
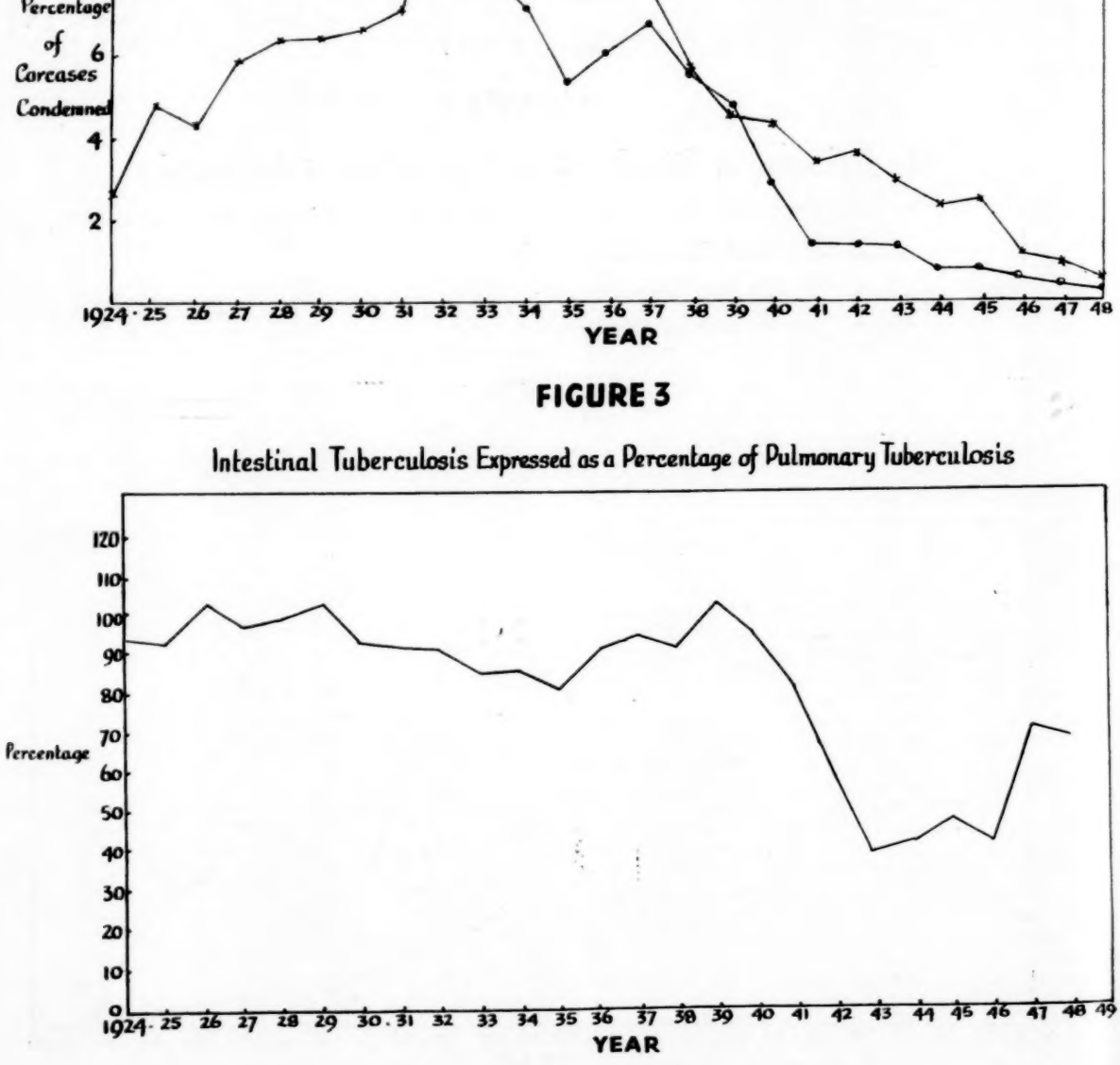


FIGURE 3

Intestinal Tuberculosis Expressed as a Percentage of Pulmonary Tuberculosis



percentage of infected animals with carcase involvement has decreased from 35 per cent. to 20 per cent. and the percentage of carcases wholly or partially condemned from 15 per cent. to 0.8 per cent. There is evidence that tuberculosis as seen in individual cows at the present day is less advanced than previously and that the extent of tuberculosis in the small residue of non-attested herds is certainly no greater and may be considerably less than the average before attestation began. It is possible that an economic price for milk is one of the factors aiding the decrease in tuberculosis in young stock.

Acknowledgments.—Our thanks are due to Mr. T. W. Gibson, Scottish Milk Marketing Board, for very full information on the price of milk during many years and to Mr. J. N. Ritchie and Mr. T. Bannatyne, of the Animal Health Division, Ministry of Agriculture and Fisheries, for the figures relating to the attested herd scheme.

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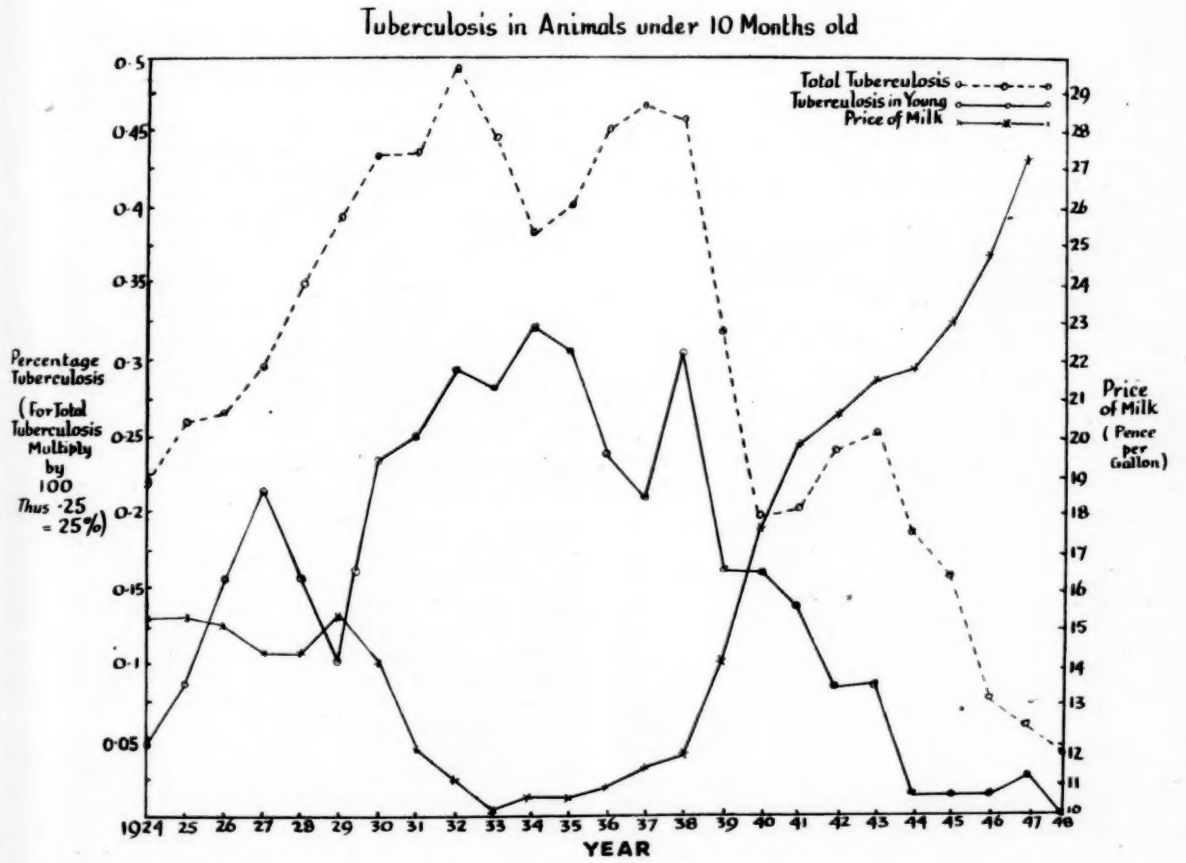
FIGURE 4



Spalding (Lincs) Urban District Council Public Health Committee has protested to the Ministry of Food regarding the sale of 48-hour-old calves for inclusion in the local meat ration. The Ministry has been informed (states the *Meat Trades Journal*) that calves should be a week old before being killed for human consumption. The Council's Medical Officer's opinion is that unless the calves are a week old they have not absorbed sufficient fatty milk from their mothers to clear the blood stream and make them fit for human consumption.

Weekly Wisdom

The land will still exact from society (which is prodigal enough with its money in other ways) the price of what it gives. If we had always considered the needs of our land, the bill would have been less heavy to-day.—Farmers' Weekly.

OPENING AND CLOSING THE ABDOMEN*

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It is not my intention to describe technical details but rather to dwell on the principles involved when opening and closing an abdomen. My remarks will not be confined to any one particular species of animal but will be a reiteration of some of the more fundamental principles which assist one in formulating a surgical approach to the abdomen so that it may be entered and closed with the least possible damage to the intervening tissues.

Before access to the sterile tissues can be obtained that barrier of contamination, the skin, has to be surmounted. The surface of the skin is heavily contaminated with organisms both transient and resident and, in addition, bacteria are found in the hair follicles and sebaceous glands. Our first attention, therefore, should be directed towards the sterilisation of the skin, so that the sterile tissues underlying it are not contaminated during the course of surgical procedures.

STERILISATION OF THE SKIN

Since for all practical purposes the skin cannot be sterilised we must direct our efforts to destroying and removing the bacteria from the surface and to destroying or confining those bacteria located within the skin which will be liberated by the initial incision.

The first stage in the preparation of the operation site is therefore the removal of the desquamating epithelium and the surface bacteria. This may be satisfactorily accomplished by the mechanical cleansing of the skin by vigorous scrubbing with soap and water, followed by shaving. In addition, this assists in emulsifying the fats and grease which harbour the resident bacteria. It has been shown that the skin itself has marked natural powers of disinfection ; this power is decreased by shaving but recovers in from four to six hours.[1] Therefore, where possible, this preliminary mechanical cleansing should be carried out on the day prior to operation.

The next stage is to attack the remaining bacteria with germicides. In this connection several points are worthy of mention. For germicides to have their optimal effect the skin must be clean, dry and fat free. The skin may be dried by the application of 95 per cent. alcohol and rendered fat free by the use of a fat solvent. For this latter purpose carbon tetrachloride, being non-inflammable, is especially useful.[2] The germicides must not damage tissue, must be maintained at their most effective concentration, must penetrate the skin and, as their action is not instantaneous, must be given time.

At this point it may be profitable to consider briefly the merits of the two germicides most commonly employed for skin sterilisation, *i.e.*, ethyl alcohol and iodine.

Ethyl alcohol is effective against vegetative organisms but has little action against spores.[3] Its bactericidal concentration is critical and unless it is maintained at the correct strength its germicidal action is low. Solutions below 50 per cent. and above 80 per cent. are valueless, its optimal strength by weight being 70 per cent.

Iodine has a great uniformity of action on different bacteria. The tincture is irritant and causes vesiculation, whereas the aqueous solution is non-irritant and has been shown to be a more effective germicide. It should not be forgotten that dry iodine has no bactericidal action.[4]

OPENING AN ABDOMEN

Having discussed the sterilisation of the skin we must next turn our attention to opening the abdomen. The purpose of opening an abdomen is to obtain access to a particular organ. In planning an incision with this in mind several points must be considered. In the first place the incision should result in as little damage as possible to the abdominal wall, and at the same time must be large enough to permit the operation to be performed expeditiously.

The incision must be large enough to give adequate exposure and permit the entrance of the hand or fingers. It should be capable of extension to provide for the unforeseen. It is better to make an incision too large rather than too small. A large incision properly made, with due regard to aseptic technique, will heal as well and as rapidly as a small one.[2] In attempts to obtain adequate exposure through too small an incision excessive trauma results and valuable time is lost.

The skin is a flexible elastic structure and when incised tends to gape. It should be incised together with the subcutaneous fascia with one or two strokes of the scalpel, care being taken to incise it at right angles to the surface and to avoid undercutting and dissecting it away from the subcutaneous fascia. As a result of incising the skin the scalpel will have become contaminated and so at this stage it should be discarded. Further to prevent the spread of infection from the cut edges of the skin, folded sterile towels should be secured to the edges of the incision.[2]

Following the skin incision, the next point to be considered is haemostasis. The degree of haemostasis desirable can only be acquired to a nicety by practice. The constituents of the blood are a very necessary scaffolding for building the initial processes of healing. If haemostasis is complete ischaemia results and healing is retarded, whereas the presence of blood clots invites infection. However, apart from the inconvenience of haemorrhage the severing of blood vessels, when opening the abdomen, is of little consequence as the blood vessel anastomoses of the abdominal wall are so numerous that there is little likelihood of causing a local ischaemia.[5] At all stages in opening an abdomen, therefore, complete haemostasis can be practised with safety and to advantage. All vessels should be picked up with artery forceps, large vessels ligated and the smaller ones left with the forceps attached until the termination of the operation. Care should be taken, however, not to include more tissue in the forceps than is absolutely necessary to occlude the vessel because their excessive use will result in areas of traumatised tissue which delay healing and predispose to infection.

To assist healing, muscles should be severed in the direction of their fibres and not transversely. In the former, the edges tend to come together, whereas in the latter the sutures are under continual tension and tend to become loose. To enter the abdomen by separating individual muscles, as when performing the pararectus incision, is not such an ideal method as it would first appear because during closure potential spaces are left wherein serum and blood may accumulate and serve as ideal media for the growth of bacteria.[5] No special point arises regarding the incision of the peritoneum except to take adequate precautions to prevent damaging underlying organs.

CLOSING AN ABDOMEN

When closing an abdomen what are the salient points to be considered? In the first place, the abdominal cavity

* Presented to the South Wales Division, N.V.M.A., at Barry, June 24th, 1949.

must be effectively sealed, and to this end the divided edges of the wound must be brought together securely, so that the normal process of healing can proceed without interruption. Each layer of tissue that has been severed should be approximated in its normal anatomical arrangement and dead space occluded.

As I have stated previously, the abdomen should be closed in layers and of prime importance is the secure closure of the peritoneum. Another important point to be considered is relaxation of the patient, which necessitates adequate anaesthesia. A tense abdomen does not permit sutures to be correctly placed and makes the closure of the peritoneum a difficult procedure. If the peritoneum is satisfactorily sutured it will keep the peritoneal cavity closed even if the structures above it break down. It is customary to close the peritoneum with a continuous suture ; this results in a degree of inversion and invites adhesions. As a rule adhesions cause little trouble unless they become attached to movable structures.

This possibility may, however, be averted by closing the peritoneum with a continuous mattress suture.[5] In small animals the peritoneum is a very delicate structure and is all too readily torn by sutures ; this may be satisfactorily overcome by including in the suture a small piece of the rectus sheath.

The best tissue for holding sutures securely is connective tissue. Since the holding power of muscle tissue is very poor, muscles should be approximated by suturing their fascia layers and only sufficient muscle tissue should be included in the suture to assure close approximation and the elimination of dead space.[6]

Sutures and Suture Materials

Finally, I should like to make a few brief remarks regarding sutures and suture materials which are an important factor when considering closure. By placing a suture one implants a foreign body. The degree of tissue reaction and response to the foreign body is dependent greatly on its size. The tissues dispose of foreign bodies by either digestion or burial. They digest absorbable materials by phagocytic action and bury the non-absorbable materials in fibrous tissue.

The essential point of a good suture is that it should be strong enough to bring and hold the structures in apposition so that healing may proceed unimpaired until complete and at the same time it should constitute as small and as non-irritating a foreign body as possible, thereby causing a minimum of tissue reaction.

The tension applied to sutures should be only sufficient to bring the tissues into apposition ; swelling follows trauma and so sutures are automatically tightened during the process of healing. If tied too tightly they interfere with blood supply, causing local areas of ischaemia which retards the healing. The size of the foreign body implanted in the tissue in the form of a suture can be reduced greatly by tying small knots, cutting off the ends close and using as fine a material as possible, consistent with strength.

Suture materials may be divided into two main categories, absorbable and non-absorbable. What are their merits and disadvantages in relation to the problem under discussion?

Absorbable materials are digested by phagocytic action and from the time they are implanted in the tissues they progressively lose their strength until at some unpredictable time during the process of healing they finally break down and give no assistance whatsoever in holding the structures together. The exact period of time for this stage to be reached cannot be predetermined accurately, and it is therefore the rapid disintegration of the catgut, which occurs occasionally in individual animals, that results in wound breakdown and evisceration. In addition, in the presence of tissue fluids catgut swells and knots become loose. To overcome this it is necessary to tie triple knots and leave the ends long, which results in a larger foreign body than is necessary.

The non-absorbable materials can be divided into those which are multi-filament, such as silk, linen and cotton, and those that are monofilament such as nylon and wire.

The chief advantages of the non-absorbable materials are that they possess great tensile strength, and in consequence fine materials can be used, thereby reducing the size of the foreign body. This is further decreased by the fact that since the knots hold well, small knots may be tied safely, and their ends cut off short. However, they have certain disadvantages. If used as a buried suture a permanent foreign body remains in the tissues and if sepsis is present suppuration will result. In this connection it is interesting to note that if cotton or linen sutures are used as buried sutures they are rarely found at subsequent operations if performed after an interval of three months. Also the multi-filament materials have the power of absorption and therefore of conducting infection.

The advantage of the mono-filament non-absorbable materials, such as nylon, is that they do not possess this power of capillary attraction and in addition have a smooth surface which is less irritant to the tissues. On the other hand, due to their smoothness it is necessary to tie a triple knot to ensure security and thereby the size of the foreign body is increased.

Generally speaking, non-absorbable materials should be used only in sterile tissues and in locations where infection cannot be conveyed to them via absorbable or multi-filament suture materials, and where they can be removed, as in the skin.

Summary

What I have said may be summarised briefly in the following terms:

One should aim at removing or limiting the bacterial contamination on and in the skin, in the first instance by mechanical methods followed by the use of germicides, due regard being given to the optimal conditions necessary for their most efficacious application.

The abdomen should be opened with least possible damage to tissues and haemostasis should be complete. The fulfilment of these requirements is greatly facilitated by making an incision of adequate length which, besides preventing unnecessary trauma, affords adequate exposure.

The abdomen should be closed by approximating the layers in their normal anatomical arrangement, bringing them together by suturing fascia and including in the sutures only a minimum of muscle.

As the majority of laparotomies are performed on small animals, I would recommend, for all general purposes, a mid-line incision through the linea alba. By this route a minimum of tissue damage results, haemorrhage is negligible and the necessary exposure for all commonly performed surgical procedures can be obtained. The linea alba being connective tissue, rapid and firm union is ensured and an excellent hold for sutures is given. Also, as muscle is not severed, post-operative pain is slight which lessens post-operative interference, an all-important factor in animal surgery.

When suturing the skin, methods should be adopted to prevent bacteria, from its surface and deeper layers, gaining access to the areas of inflammation in the divided

muscles. This is most likely to result from the passage of bacteria, by capillary attraction, along the strands of the suture material used.

This may be overcome by either using a mono-filament non-absorbable suture material or, if a multi-filament material is used, by bringing the edges of the skin together by a subcuticular suture and effecting final approximation by using a suture which does not transfix but only passes through the superficial layers of the skin.

The principles which I have discussed may not be applicable to each and every case, but will serve as a foundation on which to plan a laparotomy and will assist greatly in obtaining rapid and safe healing and thereby shorten the period of convalescence.

REFERENCES

[1] CORNBLEET, T. (1932.) *Arch. Derm. Syph.* **25.** 1058-1059.
[2] MANN, F. C., & SCHLOTTHAUER, C. F. (1934.) *J. Amer. vet. med. Ass.* **29.** 160-170.
[3] NYE, R. N., & MALLORY, T. B. (1923.) *Boston Med. Surg.* **189.** 561–563.
[4] WALTER, C. W. "Aseptic Treatment of Wounds." Chapter III.
[5] Discussion on Abdominal Incisions. *Proc. Roy. Soc. Med.* **39.** 5. March, 1946.
[6] SCHLOTTHAUER, C. F. *N. Amer. Vet.* **20.** 23-30.

REVIEW

[The Story of Animal Life. By MAURICE BURTON, D.SC., Deputy Keeper, Department of Zoology, British Museum (Natural History), with special articles contributed by zoologists of various countries. In two volumes, with over 1,000 illustrations. London: Elsevier Publishing Co., Ltd. Distributors: Cleaver-Hume Press Ltd., 42a, South Audley Street, London, W.1. Price £8 8s. 0d. the set.]

These beautifully produced volumes cannot fail to be of interest to anyone whose work is even remotely connected with zoology or natural science. Designed to have primarily a popular appeal, this work goes further into the subject than many of a similar type and aims to give the reader some insight into systematic zoology. Each species considered is discussed as to relative structure, with special reference to function and the individual mode of life.

The first volume comprises an introductory portion described as "The Framework of Animal Life" and thereafter proceeds to consider the invertebrates in detail. Volume II deals entirely with the vertebrates.

A distinguished symposium of contributors numbers authorities many of whom are already authors of works on natural history. Dr. Burton has undoubtedly taken great pains to produce a work which will enable readers to understand and correlate other more technical writings on natural history which they may wish to consult.

The numerous and excellent illustrations are in themselves an instructive study and reflect the general high standard of care taken in producing these two volumes.

On February 27th a Jersey cow broke the world's record for daily milk production for the Jersey breed, giving 120¼ lb. in the 24 hours ending at 6 a.m. The previous record was 96½ lb. The cow, Moors Pacified Diana, is seven years old, and is owned by Professor R. W. Wheldon, Dean of Agriculture at Durham University.

CLINICAL COMMUNICATION

SWAYBACK IN A FOLDED FLOCK OF SHEEP

K. C. SELLERS

VETERINARY INVESTIGATION CENTRE, INSTITUTE OF ANIMAL PATHOLOGY, CAMBRIDGE

Swayback, a demyelinating disease of young lambs associated with copper deficiency, has been recorded in many parts of the British Isles (Innes and Shearer, 1940). There is no record of its occurrence, however, in sheep whose feeding is solely confined to folding over arable crops. The purpose of this communication is to record such an outbreak which occurred in a Cambridgeshire flock of pure bred Suffolk sheep in 1949.

The flock had been maintained as a folded flock since its formation in 1923 and, until 1949, no swayback had occurred. The 1949 lambing commenced in March, about a month later than in previous years, and there was a crop of 217 lambs from 158 ewes. Fifty-nine lambs were born unable to stand and did not survive the first 48 hours of life, and a further 31 lambs showed various degrees of paralysis, some dying within a month of birth and others being slaughtered for food when they reached a size suitable for human consumption. The remaining lambs, approximately 57 per cent. of the crop, showed no symptoms of swayback.

A *post-mortem* examination of two lambs was made and in each case an extensive demyelination of the cerebrum with gross symmetrical cavitation of both hemispheres was found. Although total liver copper was not estimated, a biochemical examination indicated a low blood-copper value.

The following summarises the folding rotation of the ewe flock during the previous nine months.

1948—July, August and September, sainfoin, growing oats and tares; October and November, cabbage and kale; December, white turnips.

1949—January and February, kale, swedes, turnips and rape; March and April, kale.

During February, March and April, 1949, supplementary feeding of crushed oats was introduced at a rate of approximately ½ lb. per head.

The outbreak of swayback in 1949 was the first experienced in the history of the flock, although the management and feeding were substantially the same as in previous years. The only radical change in farming practice had been the introduction of deep ploughing three years previously. Copper deficiency was not confined solely to the sheep since store bullocks, maintained in yards on home-produced foods consisting mainly of straw, sugar-beet pulp and crushed oats, showed symptoms which could be associated with copper deficiency. A sample bleeding of 12 bullocks indicated a low blood-copper status.

Whether a "conditioning" factor such as that postulated by Jamieson and Allcroft (1949) was involved in the outbreak, or whether the crops on which the ewes were fed had a low copper content cannot be decided without further investigation, but it should be noted that deficiencies which respond to copper dressings have been reported in arable crops in East Anglia (Pizer, 1949). In addition, hypocupraemia has been encountered in East Anglia in cattle which have received a diet consisting in the main of straw and sugar-beet pulp and whose intake of pasture grass or hay has been negligible.

ABSTRACTS

[Diet and Cirrhosis of the Liver. Wahi, P. N. (1949.) *Arch. Path.* **47.** 119–152.]

The needle biopsy technique has enabled Wahi to detect many unsuspected cases of liver damage in Indians undergoing treatment for various unrelated conditions. It is well known that cirrhosis of the liver is common among certain classes of Indians, especially the vegetarian Hindus, who subsist on a decidedly ill-balanced diet. (This phenomenon is not confined to Indians, but is also found in other races with pigmented skins. In this connection the papers of C. Berman in the *South African Journal of Medical Science*, vols. **5** & **6**, 1904–41, dealing with the extraordinarily high incidence of cirrhosis and primary cancer of the liver in the Bantu races, should be consulted by those interested.)

In view of the fact that nutritional liver damage can be produced easily in experimental animals, and that diet influences the susceptibility of the liver to damage by various chemical agents such as chloroform, it was decided to investigate the relationship between the pathology of the human condition and that induced in laboratory animals.

It was found that young rats fed on carefully prepared diets deficient in protein and fat, but rich in carbohydrate, develop a necrosis of the liver parenchyma, ending in scarring. Older animals are more resistant to such a diet and survive longer, although their livers show a focal or diffuse necrosis, fatty infiltrations and early cirrhosis. Cirrhosis was found always to be preceded by fatty infiltration, but was not an invariable sequel to liver damage. Wahi suggests that some " precipitating factor," such as a toxin or virus, may play an important part, especially in cases of infantile cirrhosis in Indians.

The article contains an extensive review of the literature dealing with natural and experimental cirrhosis, and quotes a method for the quantitative estimation of fibrous tissue in the liver, which should have useful applications in experimental pathology.

J. G. C.

* * * * *

[Preliminary Note on the Cultivation of Green's Distemperoid Virus in Fertile Hen Eggs. Haig, D. A. (1948.) *Onderstepoort J.* **23.** 149–155 (7 refs.).

The author propagated Green's distemperoid virus for 30 generations on the chorio-allantoic membranes of fertile eggs which had been incubated for eight days, infected and then incubated another four days at 35° C. The titre for ferrets was 10^{-3} to 10^{-5} for chorio-allantoic membrane, and somewhat less for other tissues and fluids. The effects of the egg adapted strain in ferrets resembled those of the parent strain and were neutralised by anti-distemper serum. Of 13 dogs inoculated with it, nine showed no reaction, one a slight reaction, and three a very severe reaction.

The egg adapted virus did not agglutinate chicken or guinea-pig erythrocytes, nor did it infect mice by intranasal instillation.

A. W. G.

Acknowledgment.—My thanks are due to Dr. Ruth Allcroft, of the Ministry of Agriculture and Fisheries Veterinary Laboratory, Weybridge, for the chemical estimations.

References

Innes, J. R. M., & Shearer, G. D. (1940.) *J. comp. Path.* **53.** 1.
Jamieson, S., & Allcroft, R. (1949.) Proceedings of the 14th International Veterinary Congress, London.
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QUESTIONS AND ANSWERS

The submission of questions for inclusion in this column will be welcomed; they can relate to any aspect of veterinary work. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

Treatment of Haemolytic Staphylococcal Mastitis

Q. 342.—*I have been bothered recently by a form of mastitis in milking cows caused by a haemolytic staphylococcus. There is usually no change in the milk except a reduction in quantity and the presence of blood in small amounts. My treatment so far has been generally unsuccessful, and I should appreciate suggestions.*

A.—Haemolytic staphylococci may be found in the milk in the absence of any clinical change, and their pathogenicity can only be assumed when they are associated with such changes. A mastitis due to haemolytic staphylococci is not infrequently met with in cows in the later stages of lactation, several cases often occurring in the same herd. Treatment generally seems unreliable, though massive and prolonged doses of penicillin are sometimes effective, especially when introduced early. Doses of 100,000 units given daily for five successive days, or procaine penicillin injected after the afternoon milking, and then milked out four to six times on the following day, prior to reinjection in the evening, is a treatment yielding some degree of success. It has been shown, however, that staphylococci are, *in vitro*, highly resistant to penicillin (Jennings, Isobel W. (1947.) *Vet. Rec.* **59.** 369). These findings are confirmed, *in vivo*, by E. C. McCulloch (1947) (abstracted in *Vet. Rec.* **57.** 530). It is therefore advisable to supplement penicillin therapy with (a) staphylococcus toxoid 10, 15, and 20 c.c. doses intramuscularly at 48-hour intervals; (b) where there is pyrexia, sulphathiazole may be exhibited in an initial dose of 0·2 gm. per kg. bodyweight, followed by half doses every eight hours for 48 hours; (c) intramammary use of thiazamide ophthalmic ointment (May & Baker), one tube being injected into the stripped quarter with antiseptic precautions, followed by half a tube at the four successive milkings; and (d) as field trials of an intramammary suspension of dibromopropamidine *c* sulphathiazole (May & Baker) have shown promising results, this drug may be exhibited when it is on the market in the near future.

In addition, a careful check-up on the dairy-hygiene in the herd concerned should be undertaken, it being realised that enzootic mastitis is largely a disease of mismanagement.

. . . . .

Oedema Disease of Swine

Q. 343.—*What are the characteristic features, clinical and* post-mortem, *of oedema disease of swine?*

A.—The symptoms described by Shanks (1938) should be consulted. The following points may be noted:—

(1) Although the commonest age incidence is from ten to 14 weeks, the condition may be seen in pigs of all ages up to about 16 weeks.

(2) Some pigs may be found dead without obvious symptoms.

(3) Excitability followed by inco-ordination and paralysis developing in a relatively short time commonly is noted. The paralysis may commence in the forelegs or in the hind legs and appears to be progressive. Death may occur in from four to five hours from the onset of symptoms.

(4) Sex has nothing to do with the condition.

(5) The commonest history is that the pigs were bought in some days previously (about six to ten days).

(6) A change of feeding often appears to precipitate the attack.

(7) Over 90 per cent. of *affected* pigs die, many in a few hours, but some may linger for two or three days.

Oedema of the eyelids very often is present as an early symptom (see *Vet. Rec.* **61.** 286).

The temperature varies. In most outbreaks it is normal (the writer has not seen any affected pigs showing high temperatures), but temperatures up to 106° F. are recorded occasionally. The pigs usually are good " thrivers " and the illness is of a very sudden and dramatic nature.

Post-mortem examination may show oedema of the bowel wall or mesentery (see *Vet. Rec.* **61.** 286). Oedema may be seen subcutaneously on the face or, indeed, anywhere. Sometimes an excess of peritoneal, pleural or pericardial fluid may be all that is noticed. Pigs should be examined as soon after death as possible but do not rule out oedema if the first pig examined does not show the typical picture.

REFERENCE

SHANKS, P. S. (1938.) *Vet. Rec.* **50.** 356, 357 and 358.

. . . . .

Hypnotic For Minor Operations

Q. 344.—*What is the best hypnotic to use for minor operations* (e.g., *clipping*) *on a vicious horse?*

A.—Clipping of the nervous hunter is a common and extremely difficult problem. A method of overcoming it is to administer chloral hydrate in a quantity sufficient to induce relatively deep narcosis without the animal falling to the ground. The dose is approximately 4·5 gm. per kgm. bodyweight for horses in the weight-range 9 to 12 cwt. The average hunter weighs 10 to 11 cwt., and the dose is therefore 1½ to 1¾ oz. To obtain regular results the drug is best administered by injection into the jugular vein, but an exact technique is necessary. This is described in detail by Wright[1]. The solution *must* be administered *extremely* slowly, and injection stopped at the point at which the desired degree of narcosis is obtained, even if the amount is far short of that quoted above. If this is not done, the horse probably will fall to the ground, thus effectually negativing the purpose for which the drug is administered.

The drawback to the intravenous method is that, if sufficient chloral is given to keep the animal quiet for long enough to clip, it will almost certainly induce recumbency: and that if narcosis is only sufficiently deep to enable the animal to remain standing, it will not last long enough for the operation to be completed. To obviate this, chloral hydrate 1½ to 2 oz. may be given, if the animal is not too restive, either per os by stomach-tube or per rectum in 1½ gallons of water. Much longer, and therefore probably more useful, narcosis may be obtained by either of these routes, owing to the slow rate of absorption.

Another simple and usually effective method of inducing hypnosis is the subcutaneous injection of morphine gr. 4 *c* hyoscine gr. $\frac{1}{10}$

REFERENCE

1 WRIGHT, J. G. (1947.) " Veterinary Anaesthsia." 2nd. Ed. London.

CORRESPONDENCE

Diagnosis of Pregnancy in Bovines

Sir,—It goes without saying that the earliest possible diagnosis of pregnancy in cattle is often most advantageous to the farmer. Apart from enabling the prompt treatment of anoestrum, subœstrum and genital infections in non-pregnant animals, it is of great help in the early recognition of the sterile or relatively infertile bull. This is particularly so, when the suspected animal is a recently purchased yearling bull and perhaps shy of the artificial vagina. An extra two months' delay in the service dates of a whole batch of heifers may jeopardise seriously the owner's autumn-calving programme.

I, therefore, agree wholeheartedly with your correspondents in condemning the statement that "apart from a well-developed corpus luteum, there may be no other evidence of the existence of pregnancy at six weeks." There is certainly overwhelming evidence of pregnancy at this stage, and, like Mr. J. L. Hancock, I rely entirely on the feel of the uterine cornua without reference to any secondary cervical and ovarian changes. The great thing is to be able to palpate the free portion of each uterine horn in its entirety in a methodical and reasonably swift manner.

Starting at the posterior attached end and with forefinger and thumb gently grasping the left horn, the hand is passed anteriorly, following the curvature of the horn until the size of the latter narrows appreciably, indicating the approaching junction with the fallopian tube. The process is then repeated on the other side.

In the pregnant animal, usually about 3 inches anterior to the intercornual ligament, a soft spherical bladder-like object (the blastocyst) will slip posteriorly through thumb and finger. At the 30-day stage in the heifer it usually can be felt as being the size of a small marble, and starts losing its spherical shape at six weeks (size of golf ball), after which the swelling rapidly becomes more ovoid as the foetal fluids extend both ways along the horn. It is at this stage that the palpation of the foetal membranes becomes an invaluable diagnostic aid. A portion of the uterine wall anterior or posterior to the blastocyst is gently picked up, again with thumb and forefinger, and then gradually released, the two separate layers of foetal sac and uterine wall slipping out of one's grasp in turn, giving the operator a quite characteristic sensation when once experienced. The foetal membranes grow rapidly at this stage and at eight to nine weeks they can be palpated throughout the length of the pregnant horn. At ten weeks it is often easier to detect them in the non-pregnant horn, where the foetal fluids are scantier and not so tense. After this stage, it is usually unnecessary to employ this method as a routine. The size and fluctuating distension of the pregnant horn in comparison with the other one is sufficient to establish pregnancy. The above technique is useful, however, in the occasional animal to differentiate from a gross pyometra, which will show a thickened, atonic, single-layered uterine wall. At three months it is often possible in the same way to detect the cotyledons—still very small, of course.

Using these methods, with extensive experience, I maintain it is possible to be 99 per cent. accurate in diagnosing pregnancy at six weeks in cows and at five weeks in heifers, and I regard Mr. Hancock's claim of 90 per cent. accuracy as a trifle modest for such a skilled worker. In the majority of heifers, I agree with Mr. Pickering that one should be able to give a definite decision at 30 days in the majority of cases, and sometimes for a day or two before this the increased tone and engorgement in one horn enables one to give a tentative diagnosis.

In the animal with regular oestral cycles at the 20 to 22 day stage the presence of a corpus luteum in one ovary and the absence of a follicle with no cervical mucous discharge nor an increased compact tonicity of the uterus (due to approaching or present oestrus) indicates a strong probability of pregnancy.

Finally, I should like to underline Mr. Barrett's observation about abortions (whether they be physiological or not) at six to 12 weeks. I have met several cows in which the diagnosis was "pregnant, but foetus not viable," and, sure enough, the small decaying calf has been expelled a week or so afterwards. It is largely by the indistinct and loose impression of the foetal membranes that one can spot these cases.

Yours faithfully,

D. N. SPRIGGS.

The Grange,
Drove Road,
Swindon.

February 22nd, 1950.

REPORT

[**East African Veterinary Research Organisation.** First Annual Report (1948). E. G. White.]

This is the first report of the E.A.V.R.O., which was established under the East Africa High Commission on January 1st, 1948. The two main functions of the organisation are the preparation and issue of biological products, and the prosecution of research into animal health, animal disease and animal industry. A small amount of research was carried out during the year, but most of the work of E.A.V.R.O. was related directly or indirectly to biological products.

Research

Observations were commenced upon the use of lapinised rinderpest virus, and preliminary experiments showed that the dried spleen, blood and liver of infected rabbits would protect cattle against this virus. Fresh material from rabbits was capable of infecting these animals down to a dose of 0·000001 gm. (one millionth of a gramme), and dried material was infective in a dose of 100 times this amount. Attempts to make an avianised virus, by adapting rinderpest virus to the chorio-allantoic membrane and the yolk sac of the developing chick embryo were unfruitful. Experiments were carried out to determine the survival of rinderpest virus in animals convalescent from the disease, and in the spleen and bone marrow of infected animals when stored at −5° C. and at room temperature.

The chemotherapeutic action of "antrycide" was the subject of experiment. Observations using sub-curative doses of trypanocidal drugs indicate that recovery is due to acquired resistance of the host and not to changes in the virulence of the parasite. Cattle bred in areas where tsetse flies are present develop some degree of natural resistance.

Experiments were carried out to study the reaction of the lymph glands in susceptible cattle when a single tick infected with *Theileria* was fed on them. Enlargement of the gland precedes its invasion by parasites.

The use of various synthetic insecticides as a substitute for arsenic in cattle dips was investigated, and it was found that B.H.C. in emulsion was very effective for controlling ticks at a concentration of 1:300. The experiments showed that the dips available in E. Africa are subject to preferential removal, which must be taken into account if the dip concentration is to be maintained at the proper level. Promising results were obtained against hide beetles when hides were treated with the emulsion type B.H.C. cattle dip, and with a miscible oil preparation.

Biological Products

During 1948 the E.A.V.R.O. took over the vaccine production and methods were brought up to date. Twenty-one different vaccines and sera were produced, the principal ones being: K.A.G. virus (1,889,845 doses), blackquarter vaccine (310,730 doses), pleuropneumonia vaccine (197,026 doses), and anthrax vaccine (192,026 doses).

In the report, comment on individual vaccines is restricted to those of special importance, or to those which have given trouble during the year. The difficulty encountered in transmitting the virus in serial passage in goats was overcome by going back to stored material and using "banks" of virus for series of batches of Kabete attenuated goat virus, instead of making each batch from a new passage. The original method for the production of blackquarter vaccine was discontinued, and culture vaccine substituted. A serious breakdown occurred in the preparation of horse sickness vaccine, and valuable horses died after inoculation.

Administrative

The farm management was improved during the year, whilst small experimental animals were given better accommodation. A large rabbit colony was built up in view of the possibility of using lapinised rinderpest virus. A rinderpest conference was held in Nairobi in October-November, 1948. In February, 1948, the E. African Standing Veterinary Research Committee met at Kabete for the last time.

Appointments made during the year included Mr. J. G. Brotherston, M.R.C.V.S., and Mr. H. R. Binns, O.B.E., M.A., B.Sc., M.R.C.V.S. Arrangements were completed for the appointment of Mr. A. E. G. Markham, B.Sc., M.R.C.V.S., for a Tuberculosis Survey beginning in Tanganyika Territory; Mr. J. Todd, B.Sc. (Agr.), Dip. Agr., for nutritional work; and Dr. J. A. Dinnik for work on helminthology.

By the end of 1948 E.A.V.R.O. had a total of 22 European staff.

H. A. C.

News from Overseas

East Africa

The East African Veterinary Research Organisation is taking over the old Kenya Veterinary Research establishment near Nairobi, and will share an Animal Husbandry Section with the East African Agriculture and Forestry Research Organisation.

A Colonial Development and Welfare research grant of £15,800 has been made to East African territories in order to finance three years' research into the control of trypanosomiasis by means of antrycide.

South Africa

A serious outbreak of Newcastle disease in the Union has led to a request for 50,000 doses of vaccine from the U.S.A.

Formosa

A recent outbreak of rinderpest in Formosa was tackled with the help of the Food and Agriculture Organisation of United Nations. Virus was sent from Bangkok (where FAO had helped organise large-scale vaccine production), stored in deep-freeze plant at Hongkong, and picked up there by an FAO veterinarian, Dr. Reisinger, on his way to start vaccine production in Formosa. Recently Dr. Reisinger had been carrying out the same work in Abyssinia.

France

The French General Council of Agriculture, through its organ "Liberation Paysanne," asks "Must we throw our pigs into the sea?" The pig population exceeds that of 1939 by 25 per cent. and producers are clamouring for foreign markets. The Government is criticised for the delay in arranging the delivery of 30,000 tons of pork which Britain is expected to buy.

Hungary

The transformation of Hungary into a powerful industrial country, with a well-developed agriculture, is (states the official Hungarian News Service) the aim of the new Five-

Year Plan, beginning on January 1st, 1950. The Plan was agreed by the National Assembly, on December 10th, 1949. One of the principal aims of the Plan " is to eliminate the backward nature of Hungarian agriculture. It is intended to raise the cattle population to 2,400,000, the number of pigs to 5,600,000, sheep to 1,600,000, horses to 750,000 and poultry to about 22 million. *The milk yield will be raised by 20 per cent., the weight of pigs for slaughter by 80 per cent., and the yield of sheep wool by 13 per cent.*" (Our italics.)

NOTES AND NEWS

Diary of Events

Mar. 11th.—Meeting of the West of Scotland Division, N.V.M.A., in the Glasgow Veterinary School, 2.15 p.m.

Mar. 14th.—Meeting of the East Midlands Division, N.V.M.A., at Sutton Bonington, 2 p.m.

Mar. 14th.—Scientific Meeting of the Zoological Society of London, Regent's Park, N.W.8, 5 p.m.

Mar. 15th.—Meeting of the Royal Microscopical Society in the Hastings Hall, B.M.A. House, Tavistock Square, W.C.1, at 5.30 p.m.: Dr. G. H. Bourne (The London Hospital), "Golgi apparatus and Mitochondria and their significance in cellular physiology."

Mar. 15th.—Meeting of the North Wales Division, N.V.M.A., at Bangor (School of Agriculture, Deiniol Road), 2 p.m.

Mar. 16th.—Meeting of the Herts and Beds Division, N.V.M.A., at Luton, Beds (The George Hotel), 7.30 p.m.

Mar. 22nd.—Meeting of the Technical Development Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 10.30 a.m.

Mar. 23rd.—Annual Meeting of the Western Counties Division, N.V.M.A., at Exeter (The Rougemont Hotel), 2.15 p.m., to be preceded by Annual Luncheon (1 p.m.) and Meeting of Council (11.30 a.m.).

Mar. 24th.—Annual Meeting of the Biochemical Society, in the Department of Biochemistry, University College, Gower Street, W.C.1, 11.30 a.m. (Papers will be read and demonstrations given.)

Mar. 29th.—Meeting of the Association of Veterinary Teachers and Research Workers (Northern Region), at Messrs. Boots Veterinary Science Division, The Priory, Thurgarton, Notts, 12.30 p.m.

Mar. 31st.—Meeting of the Society of Veterinary Practitioners, at the Holborn Restaurant, London, W.C.2, 2.30 p.m.

Apr. 14th.—Dinner Dance to be held by the Yorkshire Division, N.V.M.A., at Leeds (Guildford Hotel), 7.15 for 7.30 p.m.

April 18th.—Annual Meeting of the Southern Counties Division, N.V.M.A., at Bournemouth, 6 p.m.

Apr. 19th, 20th and 21st.—**Quarterly Meetings of Council and Committees, R.C.V.S.**

N.V.M.A. Council and Committees

The next Council and Committee Meetings of the Association will be held at the Royal (Dick) Veterinary College, Edinburgh, on April 26th, 27th and 28th.

The time-table is as follows:—

WEDNESDAY, APRIL 26TH.

11 *a.m.* Veterinary State Medicine Committee.
2.30 *p.m.* Organising Committee.

THURSDAY, APRIL 27TH.

10 *a.m.* Home Appointments Committee.
11.30 *a.m.* Parliamentary and Public Relations Committee.
2 *p.m.* General Purposes and Finance Committee.

FRIDAY, APRIL 28TH

11 *a.m.* Council Meeting.

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PERSONAL

Births.—BROWN.—On February 24th, 1950, to Philip and Mary Brown, a son.

BROWN.—On March 2nd, 1950. to Jean, wife of Alan R. Brown, M.R.C.V.S., a son—Robert Duncan.

HILLMAN.—On February 21st, 1950, at Ripon Victoria Nursing Home, to Helen Margaret (Peggy), wife of Richard W. Hillman, M.R.C.V.S., a daughter—Helen Jane.

THOMSON.—On February 26th, 1950, at Carlton Lodge Maternity Home, Harrogate, to Joan (*née* Bowett), wife of P. D. Thomson, a son—William Scorer.

. . . . . .

Marriage.—MACALLISTER—MCWILLIAM.—On February 25th, 1950, at Inch Parish Church, Stranraer, by the Rev. W. Stephens, assisted by the Rev. Russell Walker, Donald Isbister, son of Mrs. M. C. Macallister, Broadstone House, Stranraer, and the late Donald Macallister, to Fay, daughter of Mr. and Mrs. Robert McWilliam, Lochans, Stranraer.

. . . . . .

Death.—STEPHENS.—On February 22nd, 1950, Jean Ray, beloved wife of Trevor K. Stephens, B.SC., M.R.C.V.S., Hellicars, Frome, Somerset.

. . . . . .

"*Family Exchange*" (*France*).—Through Mr. Charles Mahuzies, Chateau de Fontguitard, Cambounet sur Sor, Tarn, France, we have heard that Dr. Julien, Clinique Vétérinaire, 24, Rue de Port Saint Sauveur, Toulouse (Hte Garonne), who is one of the leaders of the veterinary profession in his province of France, is anxious to arrange a "family exchange." His son, who is almost 19 years old, wishes to come to England for three or four months to stay with an English family (preferably that of a veterinary surgeon) to perfect his knowledge of English. Dr. Julien is desirous of having the son of a British veterinary surgeon to stay with him for a similar period.

We believe that this would be an excellent opportunity to increase the type of family exchange which has become so popular in recent years. Any member who wishes to take advantage of this offer should communicate with the General Secretary.

. . . . . .

Holiday in Sweden in 1950.—During his visit to the International Congress in London last year a Swedish veterinary surgeon—Mr. Herbert Dahlgren—enquired whether his two children could visit the home of a veterinary surgeon and his family in Britain during the next summer for three or four weeks and, in exchange, invited two children of a British veterinary surgeon to visit his family in Sweden. He has a son, aged 14, and a daughter of 16, and would hope to exchange with children of similar ages. His home is in Ljusdahl—about 200 miles north of Stockholm—and he has a summer house by the sea at Borrby in Southern Sweden, where his guests would actually stay on a summer visit.

The Swedish holidays start about June 15th, so if Mr. Dahlgren's children could come to England soon after that time, the English children could perhaps return to Sweden with them, since the majority of English schools break up about the end of July.

Although it is perhaps early to start thinking of 1950 summer holidays, it is thought that any British veterinary surgeon interested might like to correspond beforehand with the Dahlgrens and the children might wish to do the same. Both Mr. and Mrs. Dahlgren speak a little English and their children quite a lot.

Would any British veterinary surgeon interested in this exchange kindly get in touch with the General Secretary, N.V.M.A., 36, Gordon Square, London, W.C.1, at an early date ?

* * * * *

R.C.V.S. OBITUARY

ANGLER, Englebert F., Capt. late R.A.V.C. (T.F.), 33, Hall Gate, Doncaster. Graduated Glasgow, December 17th, 1914. Died March 2nd, 1950 ; aged 62 years.

THE LATE CAPTAIN E. F. ANGLER, M.R.C.V.S.

AN APPRECIATION

As recorded in this issue, the death of Captain E. F. Angler occurred on March 2nd, at his home at 33, Hallgate, Doncaster, the news of which will be received with deep regret by many of his colleagues. Taken seriously ill in November last with heart trouble, he was confined to bed for five weeks, then seemed to be making slow but sure progress. The end came suddenly and unexpectedly.

During his student days and after qualifying in 1914 he received his early practical training with the late Mr. David Imrie, of Bishopbriggs, and he always freely acknowledged his indebtedness to his tutor. Joining the R.A.V.C. in 1915 he served with the 51st Highland Division. On demobilisation he bought Mr. Percy Abson's practice in Doncaster and since then has built up not

only a large local practice but in addition a very extensive hunting and racing practice. His services have been sought for this work from all over the country and his name has become a household word in hunting and racing circles everywhere. Besides being veterinary surgeon to Doncaster Race Committee, he frequently officiated at national horse shows including Olympia. His great ability lay in quick and accurate diagnosis, especially with lame horses, a field in which he had few equals.

In his earlier days he was keenly interested in anaesthesia and his name will always be associated with ether and oxygen anaesthesia of small animals. He was also associated with the development of the Imrie chloroform mask.

Possessing a jovial and even temperament, he was at all times approachable, and willing to give the benefit of his advice and experience to those young men who had the privilege to work under him. Whilst taking little active part in professional politics, he was always interested in up-to-date trends and developments.

The funeral took place at Fort William, his native town, on Monday, March 6th. Captain Angler was a bachelor.

W. L.

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Death of Professor Folmer Nielsen

A cable has just been received from Dr. Seidel, of Copenhagen, informing us of the death, which occurred on Monday, of Professor Folmer Nielsen, of the Veterinary and Agricultural College of that city, an authority of international repute on bovine sterility and obstetrics. The passing of Professor Nielsen, who was a distinguished participant in the International Veterinary Congress in London last August, will be mourned throughout the world—by none more deeply, beyond the country to which he brought such veterinary distinction, than by British members of the profession—and tribute will be paid in these columns in due course. We have now only opportunity to remind our readers that he was accorded Honorary Membership of the Association following his masterly demonstration at the Aberdeen Congress of 1924, and equally impressive paper at the Dublin Congress two years later.

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EXTENSION OF VETERINARY SURGEON'S PREMISES

Successful Appeal Under the Town and Country Planning Act

In November last, a local enquiry was held at Carshalton to hear an appeal under the Town and Country Planning Act, 1947, against the refusal of the Urban District Council, acting on behalf of the Surrey County Council, to permit alterations and additions to provide living accommodation and a waiting room for a veterinary establishment within the area of this local authority. Both the R.C.V.S. and the N.V.M.A. were actively engaged in advising in the case of this appeal.

The Urban District Council's refusal of permission was based on the ground that the development of the site for business purposes was contrary to the Council's proposal that the area surrounding the appeal site should eventually become purely residential. The Council raised no objection to the residential portion of the proposed extension.

It was contended for the applicant that the present use of the appeal premises had been in existence for the past 16 years; that the proposal was designed to enlarge the domestic part of the premises so as to allow for more accommodation for resident staff; and also to give better facilities for the public attending the veterinary establishment by providing a more efficient 24-hour service, as well as a waiting room of reasonable size; that even if the appeal was not allowed the present use, which was a purely professional one, would continue.

After carefully considering all the facts before him and the representations made by both parties to the appeal and by other interested persons, the Minister has now informed the Carshalton Urban District Council that he accepts the argument that the veterinary use of the premises will not be substantially affected by the proposed development and that he has decided therefore to allow the appeal.

Trade in Horses for Slaughter and Export

Report of the Rosebery Committee

As we go to press there is issued the report (to which further reference will be made in these columns) of the Committee under the Chairmanship of Lord Rosebery, which was appointed last April by the Minister of Agriculture and Fisheries and the Secretary of State for Scotland, to enquire into the trade in horses for export and slaughter. (Cmd. 7888 H.M. Stationery Office. Price 9d. net, by post 10d.)

Written and oral evidence was presented to the Committee by both the N.V.M.A. and its Scottish Branch, and the main recommendations may be summarised as follows:—

(i) So long as the export of horses is controlled by export licensing no licence should be issued for the export of a live horse to the Continent, unless there are satisfactory reasons for supposing that it will not be slaughtered. The minimum values under which no horse is to be allowed to be exported under the Exportation of Horses Act, 1937 should be raised from £25 to £80 for heavy draught horses and from £20 to £75 for vanners.

(ii) The slaughter of horses in this country for sale for human consumption should be allowed to continue.

(iii) Control of the retail price of horse flesh should be removed.

(iv) The breeding of horses for slaughter should not be encouraged.

The report also contains a number of detailed recommendations concerning conditions in slaughterhouses and about the regulations governing the transport of horses by road and rail.

In addition to Lord Rosebery, the Committee consisted of Lord Digby (Vice-President of the Royal Agricultural Society of England), Mrs. C. S. Ganley (Labour M.P. for South Battersea), Professor W. M. Mitchell (Principal of the Royal (Dick) Veterinary College, Edinburgh), and Lt.-Colonel D. A. Price White (former Conservative M.P. for Carnarvon Boroughs).

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ROYAL SOCIETY OF MEDICINE

Following the ruling given by the Board of Inland Revenue to the Registrar of the Royal College of Veterinary Surgeons that the annual subscription of the Royal Society of Medicine could be deducted as an admissible expense in computing income tax liability by veterinary surgeons assessable under Schedule D in respect of their professional profits, the Registrar communicated further with the Board and enquired whether this ruling applied to a veterinary surgeon in permanent employment such as that of a university, a research institute, or a Government department.

The Board replied that veterinary surgeons in such employment are governed by different statutory provisions as regards the question of deduction of subscriptions paid to the Royal Society of Medicine. Under Rule 9 of the rules applicable to Schedule E provision is made for a deduction in respect of expenses incurred wholly, exclusively and necessarily in the performance of the duties of the office or employment, but it is settled law that subscriptions to professional societies are allowable under this rule only where membership of the particular society concerned is an indispensable condition of the tenure of the employment.

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AIR TRAVEL CONCESSIONS FOR STUDENTS

With the approach of the Easter vacation, it will be opportune to give the following particulars of special students' fares available by British European Airways, Dorland Hall, Regent Street, London, S.W.1, between this and other European countries for full-time college or university students when travelling from college to home, or vice versa. The only formality is a certificate from the college or university giving the age, status and purpose of journey.

Students can make the Return trip (validity six months) on B.E.A. Continental services at the normal outward Single adult fare. In some instances the basis differs slightly; *e.g.*, for Gibraltar and Malta there is a 50 per cent. reduction on the *return* fare.

This facility can also be used for a combination of the U.K. and Continental services. It is *not* applicable when only the *U.K. services* are utilised, although here again rebates are available: for students under 18 years of age the monthly adult fare will apply, but with extended validity to *six months*.

Arrangements can be made through the National Union of Students or any Travel Agent or B.E.A. office.

Somewhat similar concessions are available on B.O.A.C. routes, details of which can be obtained on request.

ADDRESS OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

FOOT-AND-MOUTH DISEASE:

Bedfordshire.—Willburyhills Farm, Stotfold (March 2nd).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

THE VAGARIES OF THE TUBERCULIN TEST

Sir,—The appearance of reactors in an attested herd is always disturbing. When they occur in old-established herds, and where, from one's knowledge of the owner and management, all reasonable care is taken to avoid the introduction of infection, and when the rules applicable to attested herds are faithfully carried out, the cause often appears to be obscure.

One wonders how far investigations have been carried out to determine the incidence of so-called "false negative" and "false positive" reactions.

The appearance of occasional cases of "skin tuberculosis" cannot be the main reason for these apparent breakdowns. On the assumption that the specificity of the tuberculin used does not vary and that the interpretation of test charts is correct, I suggest that one must look for some other factor to account for reactor cattle in a herd presumed to be clear of infection.

The work of Messrs. Lamont, Kerr & McGirr on their modification of the tuberculin test, the "Stormont test," is, in my view, most impressive and convincing. One of their more significant findings—vide *Vet. Record*, August 6th, 1949—was the loss of sensitivity to tuberculin in the newly calved cow. They give a possible error of 50 per cent. of such animals which may give "false negatives" when the single intradermal comparative test is relied upon.

I am not aware of any effort being made at present to close this gap of potential trouble.

The "false positive" type of reaction is, I think, not merely the figment of wishful thinking. Time and again reactors appear in herds where new purchases are almost negligible and where the chances of the introduction of infection appear extremely remote.

The usual procedure of the order to dispose of reactors does not help to clear up this problem, and one wishes that one had knowledge that an intensive investigation is being carried out in this connection.

The tuberculin test at present is by no means as satisfactory as many of us would wish, and I know from experience that owners are being left in a puzzled and disturbed state of mind regarding its vagaries as well as the veterinary surgeons who know the herds and their management intimately.

Yours faithfully,

20, Ramsden Street, Huddersfield. W. R. McKINNA.

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ATTESTATION: MEAT CONDEMNATION IN TERMS OF RATIONS

SIR,—In our paper published in this issue of *The Veterinary Record*, we give the figures for the effect of attestation on the amount of meat condemned in the abattoir as unfit for food. It might be of topical interest to translate these into terms of rations. A normal cow dresses out at 550 lb. of second quality meat (if a tuberculous cow weighs much less than this then this loss of weight is also due to tuberculosis). On a money ration basis of 1s. 4d. per week, each cow will yield 500 rations. Each carcase partially condemned can be assumed to yield half its weight of meat while each carcase totally condemned is a complete loss. The average loss of meat for the three years preceding the introduction of attestation (1933–34–35) was, therefore, 236 carcases, or 118,000 rations per annum. The comparable figure for the last three years (1946–47–48) was 6,000 rations a year, a gain of 112,000 rations. Actually, fewer cows have been slaughtered in these last years owing, it is believed, to a general decrease in tuberculosis, abortion and mastitis. Numbers more comparable with the earlier numbers of cows slaughtered were recorded in 1944–45–46, when even with a lower degree of attestation the loss of rations was only 20,000 per annum.

Yours faithfully,

P. S. WATTS.

The Hannah Dairy Research Institute,
Kirkhill, Ayr.
January 7th, 1950.

"IS ATTESTATION A GOOD POLICY?"

Sir,—Since the whole question of resistance to tuberculosis appears to be as much a matter of debate now as it was 20 years ago, I feel that such observations as those of Mr. R. C. G. Hancock should not be brushed aside too lightly.

Our present teaching informs us that tuberculosis in the dog and the cat is practically always demonstrated in acute or rapidly progressive cases. Recently I had occasion to deal with a somewhat primitive knackery in a part of the country where the incidence of bovine tuberculosis is notoriously high. This knackery was infested with parasitic dogs and cats, and during my visits I frequently witnessed the spectacle of either one or several of these parasites feeding greedily upon the profuse red velvety lesions of pleural tuberculosis. I was, therefore, prompted to enquire from the slaughterman the average prospects of these parasites. He replied that, when they died, they did so from either violence or misadventure and never, in his experience, from disease. His statement appeared to be supported by the obvious well-being of these creatures.

Although it would be foolish to lay too much stress upon the observation of such random phenomena as the above, one must bear in mind that the really essential factor in the recovery of cases of human tuberculosis is a full and ideal diet. The dogs and cats quoted above must, of necessity, have been consuming daily a prodigious quantity of tubercle bacilli, and the only apparent factor that could in the circumstances counter that assault would be the excellence and natural suitability of the diet.

Yours faithfully,

London Stadiums' Kennels, DENIS BRANAGAN.
Hanworth Road,
Sunbury-on-Thames, Middlesex.
February 28th, 1950.

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VIABILITY OF DEMODEX

Sir,—With reference to Mr. Ian Lauder's letter (*Vet. Rec.*, Feb. 25th, 1950), while agreeing that movement of *demodex* on clinical microscopical examination may not be important, I should like to add confirmation that very occasionally during examination of skin preparations I have observed one or two parasites moving actively. In one instance I noted the movement of a parasite persisted for over 48 hours in medicinal liquid paraffin at a room temperature of about 58° F. The material which, in my experience, has yielded moving parasites was obtained from pustular lesions of canine demodicosis. The preparations were made with 5 per cent. KOH without heating.

Yours truly,

Royal Veterinary College, GORDON C. KNIGHT.
Beaumont Hospital,
Royal College Street, N.W.1.
March 1st, 1950.

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AREAS OF UTERINE NECROSIS FOLLOWING PARTURITION

Sir,—In 1943 I had a case somewhat similar to that recorded by Mr. Nye in your last issue. The subject was a Dachshund bitch which, five days after a normal whelping, showed lassitude, inappetence, and convulsions death ensued.

Post-mortem examination of the uterus revealed two slit-like perforations on each horn exuding granular pus. Two were partially blocked by omentum.

Bacteriological examination revealed the presence of *β-haemolytic streptococcus*, and other bitches from the same premises gave a positive reaction to vaginal swabs. The causative significance of these facts cannot, however, be assessed.

Yours faithfully,

13, Australia Road, Cardiff. OLWEN D. JAMES.
March 5th, 1950.

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ELECTROCUTION AT LOW VOLTAGE

Sir,—It is important to bear in mind that voltage is no criterion for the lethality of electric shock. A child has been killed by 20 volts and a man who knows the trick can take 500 without harm. What matters is the current-density in a vital organ, and the critical density varies from animal to animal and depends on the wave-form.

Yours faithfully,

C. W. HUME.

The Universities Federation for Animal Welfare,
284, Regent's Park Road,
Finchley, London, N.3.
March 3rd, 1950.

NATIONAL VETERINARY MEDICAL ASSOCIATION

Annual Congress, Cardiff, 1950

PROVISIONAL PROGRAMME

All Papers will be presented and discussed at the Technical College, Cardiff.

SUNDAY, SEPTEMBER 3RD

7.00 p.m. "At Home" in the Whitehall Rooms, Park Hotel, given by the South Wales Division, N.V.M.A.

MONDAY, SEPTEMBER 4TH

10.30 a.m. Civic welcome by the Lord Mayor of Cardiff in the Cardiff Technical College.

11.00 a.m. Official opening of the Trades Exhibition in the Technical College.

11.15 a.m. Paper: "Factors Influencing Herd Fertility in Cattle." Writer: S. L. Hignett (Frant). Openers: D. W. Deas (Lasswade); J. Smith (Carmarthen).

2.00 p.m. Ladies' pleasure trip to Porthcawl, returning at about 5 p.m.

3.00 p.m. Film Show at the Technical College.

7.30 p.m. Civic Reception at Assembly Room, City Hall.

TUESDAY, SEPTEMBER 5TH

10.00 a.m. Paper: "Clinical Diagnosis of Diseases of the Abdomen in the Dog and Cat." Writer: J. S. J. Lauder (Hale Barns). Openers: Miss O. D. James (Cardiff); J. W. Heney (Dublin).

11.00 a.m. Ladies' pleasure trip to the Wye Valley, returning about 4.30 p.m.

11.30 a.m. Paper: "The More Obscure Diseases of the Pig." Writers: H. G. Lamont and D. Luke (Belfast). Openers: P. L. Shanks (Leeds); J. F. Timoney (Dublin).

2.00 p.m. Surgical and other demonstrations at Whitchurch Mental Hospital Farm:—
1. Soundness in the Heavy and Light Horse.
2. Modern Methods of Anaesthesia in Animals (*a*) Local, (*b*) General, in the Bovine, Equine and Small Animals.

5.00 p.m. N.V.M.A. Council Meeting in the Council Chamber, City Hall.

7.30 p.m. Annual Banquet in the Assembly Room, City Hall.

WEDNESDAY, SEPTEMBER 6TH

10.30 a.m. Paper: "Deficiency Diseases, particularly Acetonaemia." Writer: Dr. Carlstrom (Sweden). Openers: R. H. Smythe (Nottingham); J. R. Holmes (Liverpool University Veterinary Field Station).

2.30 p.m. Congress Photograph on the steps of the Museum.

3.00 p.m. N.V.M.A. Annual General Meeting at the Technical College.

7.30 p.m. President's Reception at the Country Club, St. Mellon's.

THURSDAY, SEPTEMBER 7TH

10.00 a.m. Paper: "Symposium on Sheep Diseases." Writers: S. Jamieson (Aberdeen); L. E. Hughes (Aberystwyth); W. T. Rowlands (Bangor); J. T. Stamp (Edinburgh). Openers: D. E. Davies (Cornwall); D. R. Allen (Cardiff).

11.45 a.m. Sectional Meetings.

Afternoon. (*a*) Bowls Competition at the invitation of the Barry Athletic Club. (Organiser: R. W. Hall, Barry.) Tea at the Merrie Friars Café, Barry, at the invitation of the President, South Wales Division—R. W. Hall.
(*b*) Golf Competition at the Penylan Golf Club. (Organiser: C. J. Pugh, Newport.)

8.00 p.m. Ladies' Guild Dance. Venue to be arranged.

FRIDAY, SEPTEMBER 8TH

10.00 a.m. Paper: "Diseases of the Ruminant Stomach." Writer: H. Begg (Strathaven). Openers: A. T. Morgan (Carmarthen); D. G. E. Davies (Llandyssul).

11.30 a.m. Paper: "S.19 and the Control of Brucellosis." Writer: J. R. Lawson (Weybridge). Openers: A. J. Wright (Macclesfield); and another.

2.30 p.m. Closing Meeting of the Congress at Cardiff Technical College.
Council Meeting N.V.M.A. at Cardiff Technical College.

N.V.M.A. CONGRESS AT CARDIFF

Hotel Accommodation

We are advised that hotel accommodation available in Cardiff at the time of the N.V.M.A. Congress (September 3rd to 8th inclusive) is limited.

Members are urged, therefore, to book their rooms as early as possible, and to facilitate this we reproduce below particulars of such block reservations as the Provisional Committee has been able to make. They are asked to note specially:—

1. That these particular reservations are contingent on applications being received from members at least two months prior to the opening of the Congress;
2. That applications should be made direct to the hotel concerned and *not* to the Local Secretary; and
3. That, in making application, members should mention the fact that they are veterinary surgeons attending the Congress.

	Block Reservations			*(All nett charges)*		
	Single Rooms	*Twin-Bedded Rooms*	*Double-Bed Rooms*	*Bed and Breakfast (Single)*	*Bed and Breakfast (Double)*	*Board Per Day*
Angel Hotel, Westgate Street, Cardiff... ...	10	6	5	19/6	39/–	30/6
Alexandra Hotel, Queen Street, Cardiff ...	—	4	2	14/6	29/–	23/–
Queen's Hotel, St. Mary Street, Cardiff ...	2	11	8	16/6	33/–	24/6
Barry's Hotel, St. Mary Street, Cardiff ...	10	5	10	16/6	32/–	25/–
Sandringham Hotel, St. Mary Street, Cardiff...	12	6	3	15/–	30/–	23/–
Park Hotel, Park Place, Cardiff (Headquarters Hotel)	30	16	12	16/6	33/–	25/6
Marine Hotel, Barry Island	—	2	2	14/6	29/–	21/–
Barry Hotel, Barry	3	3	3	14/6	29/–	24/–
Esplanade Hotel, Penarth	6	6	6	15/6	31/–	25/6
	73	59	51			

ADDITIONAL HOTELS WITHOUT RESERVATIONS

We have also been furnished with the following list of additional hotels to which applications for accommodation also can be made. Here, again, the necessity for early application is stressed.

Railway Station Hotel, Station Approach, Cardiff.

Philharmonic Hotel, St. Mary Street, Cardiff.

Gwalia Hotel, Barry.

Ship Hotel, Barry.

Seafield Hotel, 14, The Parade, Barry.

PRIVATE HOTELS

"Cedars," Fidlas Road, Cardiff.
"Ashburton," 227, Newport Road, Cardiff.
Mrs. Kennett, 60, Park Place, Cardiff.
Mrs. Cleves, 8, Tydraw Road, Cardiff.
Hamilton Guest House, 82, Penylan Road, Cardiff.
Mrs. Hesbronder, 233, Allensbank Road, Cardiff.
St. David's Hotel, 103, Newport Road, Cardiff.
Mrs. Woodward, 193, Newport Road, Cardiff.
Mr. Begg, 36, Hamilton Street, Cardiff.
Mrs. Springett, 26, Column Road, Cardiff.
Lyndon Court Hotel, 191, Newport Road, Cardiff.